

**PENDING CLAIMS AND STATUS THEREOF**

1. (currently amended): A method of [[for planning and]] scheduling a manufacturing line [[mass production of items according to customer orders]] comprising:

[[repeating a series of steps a plurality of times during a manufacturing shift, the series of steps comprising:]]

[[using at least one outstanding customer order to generate]] generating a work schedule and a material delivery schedule using at least one outstanding customer order, each customer order of the at least one outstanding customer order including at least one item, the generating the work schedule including scheduling work to manufacture each item of the at least one item on an operation of at least one operation on the manufacturing line, the generating the delivery schedule including scheduling a delivery of material to manufacture each item of the at least one item to the operation, wherein the scheduling the delivery includes scheduling the delivery of the material prior to the time the material is needed according to the work schedule;

providing the work schedule to the manufacturing line, substantially immediately after generating the work schedule, for initiating work to mass produce each of the at least one item according to the work schedule; and

providing the material delivery schedule for the delivery of the material to manufacture each item of the at least one item according to the material delivery schedule;

wherein one or more items are manufactured on the manufacturing line according to the schedule.

2. **(currently amended)**: The method of claim 1 wherein:

**[each time of the plurality of times that the series of steps is repeated is a repetition; and]**

**[[the]] scheduling the delivery of the material prior to the time the material is needed according to the work schedule includes scheduling the delivery of the material at most one repetition prior to the time the material is needed.**

3. **(currently amended)**: The method of claim 1 wherein:

the material is delivered from an available inventory of material at a material source.

4. **(currently amended)**: The method of claim 2 wherein:

the available inventory includes at least one of a group consisting of the following:

an in-house inventory; and

an external inventory.

5. **(currently amended)**: The method of claim 4 wherein:

the external inventory includes at least one of a group consisting of the following:

a supplier inventory; and

a hub inventory.

6. **(currently amended)**: The method of claim 4 wherein:

the available inventory further comprises an in-transit inventory.

7. (currently amended): The method of claim 1 wherein:

the generating a work schedule comprises adding work to the work schedule; and  
the generating a material delivery schedule comprises adding a delivery of the identified material from an available inventory of material to an operation of at least one operation on a manufacturing line to the material delivery schedule.

8. (currently amended): The method of claim 7 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule at a start time; and  
the adding the delivery to the material delivery schedule comprises adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

9. (original): The method of claim 7 further comprising:

determining an expected availability of the identified material from the available inventory; and wherein  
the adding the work to the work schedule includes adding the work at a start time after the expected availability of the identified material.

10. (original): The method of claim 9 wherein the determining the expected availability of the identified material from the available inventory comprises:

determining whether the available inventory of material includes the identified material;

when the available inventory includes the identified material, determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material;

when the available inventory does not include the identified material, determining that the expected availability is that the identified material is not available.

11. (currently amended): The method of claim 10 wherein:

the determining that the expected availability is that the identified material is not available further comprises flagging an exception.

12. (currently amended): The method of claim 7 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule according to a priority of the customer order.

13. (currently amended): The method of claim 7 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule according to an order date of the customer order.

14. (currently amended): The method of claim 1 wherein:

the item is a commodity.

15. (currently amended): A method for [[planning and]] scheduling [[mass production of times according to customer orders]] a manufacturing line comprising:

- using a customer order for an item to determine material to manufacture the item;
- identifying material to manufacture the item from an available inventory of the material;
- adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;
- adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;
- providing substantially immediately the work schedule to the manufacturing line for manufacturing the item according to the work schedule; and
- providing the material delivery schedule for delivering the material according to the material delivery schedule.

16. (currently amended): The method of claim 15 wherein:

- a plurality of work schedules for one manufacturing line are generated during a manufacturing shift.

17. (currently amended): The method of claim 15 wherein:

- a plurality of material delivery schedules for one manufacturing line are generated during a manufacturing shift.

18. (currently amended): The method of claim 15 wherein:

- the available inventory includes an external inventory.

19. **(currently amended):** The method of claim 18 wherein:

the external inventory includes at least one of a group consisting of the following:

- a supplier inventory; and
- a hub inventory.

20. **(currently amended):** The method of claim 15 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule at a start time; and

the adding the delivery to the material delivery schedule comprises adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

21. **(currently amended):** The method of claim 15 further comprising:

determining an expected availability of the identified material from the available inventory;

and wherein:

the adding the work to the work schedule includes adding the work at a start time after the expected availability of the identified material.

22. (original): The method of claim 21 wherein the determining the expected availability of the identified material from the available inventory comprises:

determining whether the available inventory of material includes the identified material;

when the available inventory includes the identified material, determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material;

when the available inventory does not include the identified material, determining that the expected availability is that the identified material is not available.

23. (currently amended): The method of claim 22 wherein:

the determining that the expected availability is that the identified material is not available further comprises flagging an exception.

24. (currently amended): The method of claim 15 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule according to a priority of the customer order.

25. (currently amended): The method of claim 15 wherein:

the adding the work to the work schedule comprises adding the work to the work schedule according to an order date of the customer order.

26. (currently amended): The method of claim 15 wherein:

the available inventory comprises at least one of a group consisting of the following:

- an in-house inventory; and
- an external inventory.

27. (currently amended): The method of claim 26 wherein:

the available inventory further comprises an in-transit inventory.

28. (currently amended): The method of claim 15 wherein:

the item is a commodity.

29. (currently amended): The method of claim 15 wherein:

the using a customer order includes using a plurality of customer orders.

30. (original): The method of claim 15 further comprising:

assigning one of a plurality of manufacturing lines to the customer order.

31. (currently amended): The method of claim 15 wherein:

the identified material includes a plurality of identified materials.

32. (currently amended): The method of claim 15 wherein:

the adding the work to the work schedule includes adding a plurality of work to the work schedule.

33. (**currently amended**): The method of claim 15 wherein:

the adding the delivery to the material delivery schedule includes adding a plurality of deliveries to the material delivery schedule.

34. (**currently amended**): The method of claim 15 wherein:

the customer order includes a plurality of items.

35. (original): A computer system comprising:

a processor; and

a memory, the memory storing instructions to be executed by the processor, the instructions comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift; and

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule.

36. (**currently amended**): The computer system of claim 35 wherein:

the instructions to generate the material delivery schedule include instructions to generate the material delivery schedule such that the material scheduled to be delivered includes material scheduled to be delivered from an available inventory of material at a material source.

37. (**original**): The computer system of claim 36 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

an in-house inventory; and

an external inventory.

38. (**currently amended**): The computer system of claim 37 wherein:

the instructions for determining the available inventory from the external inventory include instructions for determining the available inventory from at least one of a group consisting of the following:

a supplier inventory; and

a hub inventory.

39. (original): The computer system of claim 36 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

- an in-house inventory;
- an external inventory; and
- an in-transit inventory.

40. (currently amended): The computer system of claim 35 wherein:

the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and

the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the material from an available inventory of material to an operation of at least one operation on a manufacturing line.

41. (currently amended): The computer system of claim 40 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and

the instructions for adding the delivery to the material delivery schedule comprise instructions for adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

42. (currently amended): The computer system of claim 40 further comprising:  
instructions for determining an expected availability of the identified material from the  
available inventory;  
and wherein:  
the instructions for adding the work to the work schedule include instructions for adding  
the work at a start time after the expected availability of the identified material.

43. (original): The computer system of claim 42 wherein the instructions for determining the  
expected availability of the identified material from the available inventory comprise:  
instructions for determining whether the available inventory of material includes the identified  
material;  
instructions for determining a replenishment time for the identified material and using the  
replenishment time to determine the expected availability of the identified material when the  
available inventory includes the identified material; and  
instructions for determining that the expected availability is that the identified material is  
not available when the available inventory does not include the identified material.

44. (currently amended): The computer system of claim 40 wherein:  
the instructions for adding the work to the work schedule comprise instructions for  
adding the work to the work schedule according to a priority of the customer order.

45. (currently amended): The computer system of claim 40 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

46. (original): A computer system comprising:

a processor; and

a memory, the memory storing instructions to be executed by the processor, the instructions comprising:

instructions for using a customer order for an item to determine material to manufacture the item;

instructions for identifying material to manufacture the item from an available inventory of the material;

instructions for adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule substantially immediately to the manufacturing line for manufacturing the item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule.

47. (currently amended): A [[computer program product]] computer-readable medium containing a data structure comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift;

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule; and

a computer-readable medium for storing the instructions for repeating, the instructions for using, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

48. (currently amended): The [[computer program product]] medium of claim 47 wherein:  
the instructions to generate the material delivery schedule include instructions to generate  
the material delivery schedule such that the material scheduled to be delivered includes material  
scheduled to be delivered from an available inventory of material at a material source.

49. (currently amended): The [[computer program product]] medium of claim 48 further  
comprising:

instructions for determining the available inventory from at least one of a group  
consisting of the following:

an in-house inventory; and  
an external inventory.

50. (currently amended): The [[computer program product]] medium of claim 49 wherein:  
the instructions for determining the available inventory from the external inventory  
include instructions for determining the available inventory from at least one of a group  
consisting of the following:

a supplier inventory;  
and a hub inventory.

51. (currently amended): The [[computer program product]] medium of claim 48 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

- an in-house inventory;
- an external inventory; and
- an in-transit inventory.

52. (currently amended): The [[computer program product]] medium of claim 47 wherein:

the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and

the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the identified material from an available inventory to an operation of at least one operation on a manufacturing line.

53. (currently amended): The [[computer program product]] medium of claim 52 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and

the instructions for adding the delivery to the material delivery schedule comprise instructions for adding the delivery to the material delivery schedule at a material delivery time prior to the start time.

54. (currently amended): The [[computer program product]] medium of claim 52 further comprising:

instructions for determining an expected availability of the identified material from the available inventory;

and wherein:

the instructions for adding the work to the work schedule include instructions for adding the work at a start time after the expected availability of the identified material.

55. (currently amended): The [[computer program product]] medium of claim 54 wherein the instructions for determining the expected availability of the identified material from the available inventory comprise:

instructions for determining whether the available inventory of material includes the identified material;

instructions for determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material when the available inventory includes the identified material; and

instructions for determining that the expected availability is that the identified material is not available when the available inventory does not include the identified material.

56. (currently amended): The [[computer program product]] medium of claim 52 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to a priority of the customer order.

57. (currently amended): The [[computer program product]] medium of claim 52 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

58. (currently amended): A [[computer program product]] computer-readable medium containing a data structure comprising:

instructions for using a customer order for an item to determine material to manufacture the item;

instructions for identifying material to manufacture the item from an available inventory of the material;

instructions for adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule substantially immediately to the manufacturing line for manufacturing the item according to the work schedule;

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule; and

a computer-readable medium that stores the instructions for using, the instructions for identifying, the instructions for adding work to a work schedule, the instructions for adding a delivery to a material delivery schedule, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

59. (currently amended): A signal embodied in a carrier wave on a communication medium comprising:

instructions for repeating a series of steps a plurality of times during a manufacturing shift;

instructions for each step in the series of steps comprising:

instructions for using at least one outstanding customer order to generate a work schedule and a material delivery schedule, each customer order of the at least one outstanding customer order including at least one item, the work schedule including work to manufacture each item of the at least one item, the delivery schedule including delivery of material to manufacture each item of the at least one item;

instructions for providing the work schedule to a manufacturing line substantially immediately after generating the work schedule for initiating work to mass produce each of the at least one item according to the work schedule; and

instructions for providing the material delivery schedule for delivering the material to manufacture each item of the at least one item according to the material delivery schedule, wherein the material is scheduled to be delivered to an operation of at least one operation of the manufacturing line substantially immediately prior to the time the material is needed according to the work schedule; and

a computer-readable medium for storing the instructions for repeating, the instructions for using, the instructions for providing the work schedule, and the instructions for providing the material delivery schedule.

60. (currently amended): The signal of claim 59 wherein:

the instructions to generate the material delivery schedule includes instructions to generate the material delivery schedule such that the material scheduled to be delivered includes material scheduled to be delivered from an available inventory of material at a material source.

61. (original): The signal of claim 60 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

an in-house inventory; and

an external inventory.

62. (currently amended): The signal of claim 61 wherein:

the instructions for determining the available inventory from the external inventory include instructions for determining the available inventory from at least one of a group consisting of the following:

a supplier inventory; and

a hub inventory.

63. (original): The signal of claim 60 further comprising:

instructions for determining the available inventory from at least one of a group consisting of the following:

- an in-house inventory;
- an external inventory; and
- an in-transit inventory.

64. (currently amended): The signal of claim 59 wherein:

the instructions to generate a work schedule comprise instructions for adding work to the work schedule; and

the instructions to generate a material delivery schedule comprise instructions for adding a delivery of the identified material from an available inventory to an operation of at least one operation on a manufacturing line.

65. (currently amended): The signal of claim [(65)] 64 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule at a start time; and

the instructions for adding the delivery to the material delivery schedule comprise:

instructions for adding the delivery to the material delivery schedule at [(the)] a material delivery time prior to the start time.

66. (currently amended): The signal of claim [[60]] 64 further comprising:

instructions for determining an expected availability of the identified material from the available inventory [[; and]] wherein the instructions for adding the work to the work schedule include instructions for adding the work at a start time after the expected availability of the identified material.

67. (original) The signal of claim 66 wherein the instructions for determining the expected availability of the identified material from the available inventory comprise:

instructions for determining whether the available inventory of material includes the identified material;

instructions for determining a replenishment time for the identified material and using the replenishment time to determine the expected availability of the identified material when the available inventory includes the identified material; and

instructions for determining that the expected availability is that the identified material is not available when the available inventory does not include the identified material.

68. (currently amended): The signal of claim 64 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to a priority of the customer order.

69. (currently amended): The signal of claim 64 wherein:

the instructions for adding the work to the work schedule comprise instructions for adding the work to the work schedule according to an order date of the customer order.

70. (currently amended): A signal [[embodied in a carrier wave]] on a network comprising:

instructions for using a customer order for an item to determine material to manufacture the item;

instructions for identifying material to manufacture the item from an available inventory of the material;

instructions for adding work to a work schedule, the work being to manufacture the item at an operation of at least one operation of a manufacturing line using the identified material;

instructions for adding a delivery to a material delivery schedule, the delivery being of the identified material from the available inventory to the operation;

instructions for providing the work schedule substantially immediately to the manufacturing line for manufacturing the item according to the work schedule;

instructions for providing the material delivery schedule for delivering the material according to the material delivery schedule.